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SUMMARY STATEMENT ON THE  
1952 BLOWDOWN-BARK-BEETLE SURVEY IN THE  
DOUGLAS-FIR REGION OF OREGON AND WASHINGTON

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INTRODUCTION

A special survey was made during the summer of 1952 to determine the location and volume of timber mortality caused by recent severe windstorms and an associated epidemic of the Douglas-fir beetle in western Oregon and southern Washington. This summary statement gives the findings in brief and reviews the highlights of the project. A comprehensive report on all phases of the survey is being prepared for issuance at a later date.

Attached to this statement are three maps and two tables. Map No. 1 shows the area covered by the survey. Map No. 2 shows the generalized location of blowdown according to three intensity classes. Map No. 3 shows similar information for tree-killing by the Douglas-fir beetle. The two tables present summaries of the acreage and volume affected by both blowdown and the bark beetle.

The generalized maps attached to this report were made from one-inch-to-the-mile maps showing detailed information mapped during the course of the survey. Copies of the detailed maps have been distributed to land managers, to public forest agencies, and to interested land owners and individuals, to encourage a maximum of immediate timber salvage and, consequently, control of the beetles. For control or salvage planning on any specific area reference should be made to the detailed maps, which are available at the Pacific Northwest Forest and Range Experiment Station, 443 U. S. Court House, Portland, Oregon.

SURVEY OBJECTIVES

The immediate objective of the survey was to provide data for developing a salvage program to minimize the anticipated expansion of the already severe Douglas-fir beetle epidemic. The long-term objective was to enable forest managers to modify logging plans so as to utilize the dead and down timber before excessive deterioration occurs.

SURVEY FINDINGS

The survey revealed that the combined loss from last winter's blowdown and 1951 attacks of the Douglas-fir beetle was 10 billion board feet. This constitutes the most serious damage to stands of the Douglas-fir region since the disastrous Tillamook Burn of 1933.

It is expected that, if the beetle infestation is allowed to run its normal course, an additional 2 to 5 billion board feet of Douglas-fir saw timber will be killed. Large-scale and timely salvage can materially reduce this prospective mortality. Some killing has occurred outside of the surveyed area. This loss is not included in the following figures, nor in the information shown on the maps. Losses in the area covered by this survey to mid summer of 1952 are as follows:

Locality	Area of concentrated blowdown	Volume losses 1/			
		Concentrated blowdown	Scattered blowdown	Beetle kill	Total
	Acres	M bd. ft., log scale			
Coast Range	127,019	1,104,802	2,644,223	454,933	4,203,958
Cascades	74,781	378,519	4,752,497	550,289	5,681,305
Total	201,800	1,483,321	7,396,720	1,005,222	9,885,263

1/ Estimated sampling error: Coast Range - 13 percent  
Cascades - 31 percent

#### Blowdown

Two distinct types of blowdown were encountered on the survey, each presenting special problems from the standpoint of salvage and potential for increase of the beetle population. One type was the blowdown that occurred in concentrated patches. The other was the blowdown that occurred as scattered individual trees and small groups of trees over extensive areas.

Map No. 2 shows that most of the concentrated blowdown resulting from last winter's storms is in the Coast Range of Oregon. Much of this came in a single storm--on December 4, 1951. The whole Coast Range area, from approximately the north boundary of Polk County to the north boundary of Josephine County, is pock-marked with patches of concentrated blowdown. In the Cascade area, there was relatively less blowdown. Since the survey of this area was on a sampling basis, the actual amount of blowdown there is probably greater than is shown on the map.

The scattered type of blowdown is not shown on map No. 2. It was found throughout the whole area covered by the survey, and therefore is of significance in forecasting the future of the beetle population. In spite of its large total volume, only a relatively small amount of this scattered blowdown can be salvaged immediately.

#### Beetle Kill

Map No. 3 illustrates in generalized form the bark-beetle situation in standing timber as of July, 1952. Since the field work was completed, a large number of newly attacked trees has shown up. Up to

July, however, the concentration of kill remained in the same general pattern as was shown by a preliminary aerial reconnaissance survey made early in the spring of 1952. <sup>1/</sup> Counties suffering the most damage in Oregon are Coos, Douglas, Jackson and Lane; Klickitat and Skamania counties contain most of the infestation in Washington. Other areas also show significant amounts of tree-killing, and in view of the anticipated insect build-up in windblown timber may be expected to develop into serious outbreak areas by 1953 or 1954.

## SIGNIFICANCE OF FINDINGS

### Further Beetle Killing

Additional heavy killing should be expected. Even without the recent blowdown material to serve as a spring-board for further spread, additional killing would be expected from the infestation in the standing trees. Timber that is blown down or fire killed fosters the development and spread of beetle population. Hence, in those portions of the region where there is existing beetle kill and either concentrated blowdown or fire-killed timber, further heavy killing by beetles is certain for the next two years at least. Unfortunately, scattered windthrow also provides excellent breeding material for the Douglas-fir beetle. The scattered blowdown that was found wherever check plots were tallied is likely to foster the development and spread of the beetle epidemic into many areas not yet heavily infested.

### Possible Control

No known method of spray control would be feasible for this situation. Salvage logging is the only practical answer. Here the question is--what are the priorities?

The greatest control value for the money expended will come from salvage logging for beetle control directed at concentrations of recent blowdown, particularly where they are associated with beetle-killed or fire-killed timber still harboring beetles. This problem is so large that salvage of lesser concentrations of blowdown, and even heavy concentrations in remote areas, will have to be postponed even though this action means continuing loss from new beetle attacks in areas not reached.

### Fire Hazard

Maps 2 and 3 both suggest areas on which a changed emphasis in fire protection may be necessary during the next several years. Areas of concentrated windthrow and also areas of concentrated beetle-killing

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<sup>1/</sup> Report of Reconnaissance Surveys of the 1951 Douglas-fir Bark-beetle Epidemic in Oregon and Washington by Weyerhaeuser Timber Company, Oregon State Board of Forestry and U. S. Bureau of Entomology and Plant Quarantine, Portland, Oregon, April 28, 1952.

present increased fire hazard and a corresponding need for increased protection against fire. To the extent the concentrations of snags and blowdown trees cannot be salvaged, the local fire protection programs may have to be intensified.

#### SUGGESTED ACTION

The obvious first need is an aggressive salvage program. This is the only practical way in which future loss by the beetles can be minimized. Removing infested standing and down trees prior to the emergence of new beetle broods in the spring of 1953 will have control benefits. Similar benefits can be obtained in succeeding years by utilizing infested timber before the beetles emerge and make new attacks. There has already been progress in effecting beetle control through salvage logging, but the major part of this job is still ahead.

Roads will be needed into many parts of the affected forests to permit salvage. The current survey did not obtain information on this need. The one-inch-to-the-mile scale maps which have been published and distributed to land owners and managers should permit making decisions on areas to be investigated in detail for road-construction purposes.

There has already been enough destruction to intensify the fire-protection problem for much of western Oregon. Again, this survey did not obtain specific information for this purpose, but the data shown on the one-inch-to-the-mile scale maps can be very helpful. The beetle impact on fire problems will continue as long as large volumes of dead standing and down timber remain unsalvaged.

It is vitally important that land owners and land managers keep closely in touch with what is happening on their holdings during the next several years. The present combination of circumstances threatens a rapid expansion of the bark-beetle population. The only way an owner can be sure of what is happening on his lands is to make frequent and comprehensive examinations of his Douglas-fir timber.

In addition to the previous items there is urgent need for annual surveys on a region-wide basis for the next several years. As a minimum, such surveys should maintain a check on beetle activity throughout the Douglas-fir producing areas.

#### THE SURVEY PROJECT

The 1952 Blowdown Bark Beetle Survey was a cooperative project that employed aerial mapping and ground survey techniques. A total of nearly 13,500,000 acres was covered in mapping and scouting flights

during July 1952. Of this acreage, about 11,500,000 acres were covered intensively by systematic survey flights in planes manned by trained mappers. Maps on a one-inch-to-the-mile scale showing information on location of blowdown and beetle kill were published for about 10,500,000 acres that showed a significant amount of damage due to wind or the beetles.

The project did not make use of aerial photography because of technical difficulties and the importance of getting the job done quickly. Instead, flying mappers using one-inch-to-the-mile scale maps marked blowdown and bark beetle damage in place as they flew on predetermined flight lines. A certain proportion of the mapped areas of blowdown was later visited by ground crews who laid out and measured the damage on sample plots. From the two sets of information volume and acreage totals were determined.

The project cost a total of \$83,600, of which \$10,000 was made available in cash from the Oregon State Board of Forestry. Nearly \$11,000 was contributed in manpower and services from all the organizations participating. The balance, \$62,600, came from Forest Pest Control funds allotted to the U. S. Forest Service.

Personnel participating in the project came from the Forest Insect Laboratory of the U. S. Bureau of Entomology and Plant Quarantine, Region 6 of the U. S. Forest Service, Region 1 of the Bureau of Land Management, the Oregon State Board of Forestry, the Pacific Northwest Forest and Range Experiment Station, the Industrial Forestry Association, Willamette Valley Tree Farm Service, Inc., and the U. S. Weather Bureau. Services to the project in addition to manpower were contributed by all of the above agencies and also by Region 7 of the Soil Conservation Service.

Table 1.--Acreage of concentrated blowdown by counties

(Acres)

County	Class of blowdown 1/		
	Heavy	Moderate	Cut over
Coast Area			
Tillamook	147	53	140
Yamhill	22	18	280
Lincoln	2,163	1,564	2,090
Polk	578	142	740
Benton	1,002	818	2,550
Lane	11,023	7,411	13,900
Douglas	15,021	21,899	15,770
Coos	7,585	6,701	10,490
Curry	1,641	2,145	510
Josephine	129	357	130
Total, Coast	39,311	41,108	46,600
Cascade Area			
Skamania	181	886	493
Klickitat			164
Subtotal, Wash.	181	886	657
Multnomah			110
Hood River	652	195	657
Clackamas	1,479	1,078	1,698
Marion	98	98	712
Linn	3,116	3,337	5,531
Lane	8,597	11,909	14,073
Douglas	3,393	5,791	9,750
Jackson	41		30
Josephine			712
Subtotal, Ore.	17,376	22,408	33,273
Total, Cascades	17,557	23,294	33,930
Grand Total	56,868	64,402	80,530

1/ These classes are defined as follows:

Heavy - 25% or more of the stems blown down.

Moderate - 10-25% of the stems blown down.

Cut over - 25% or more of the stems blown down in cut-over areas.

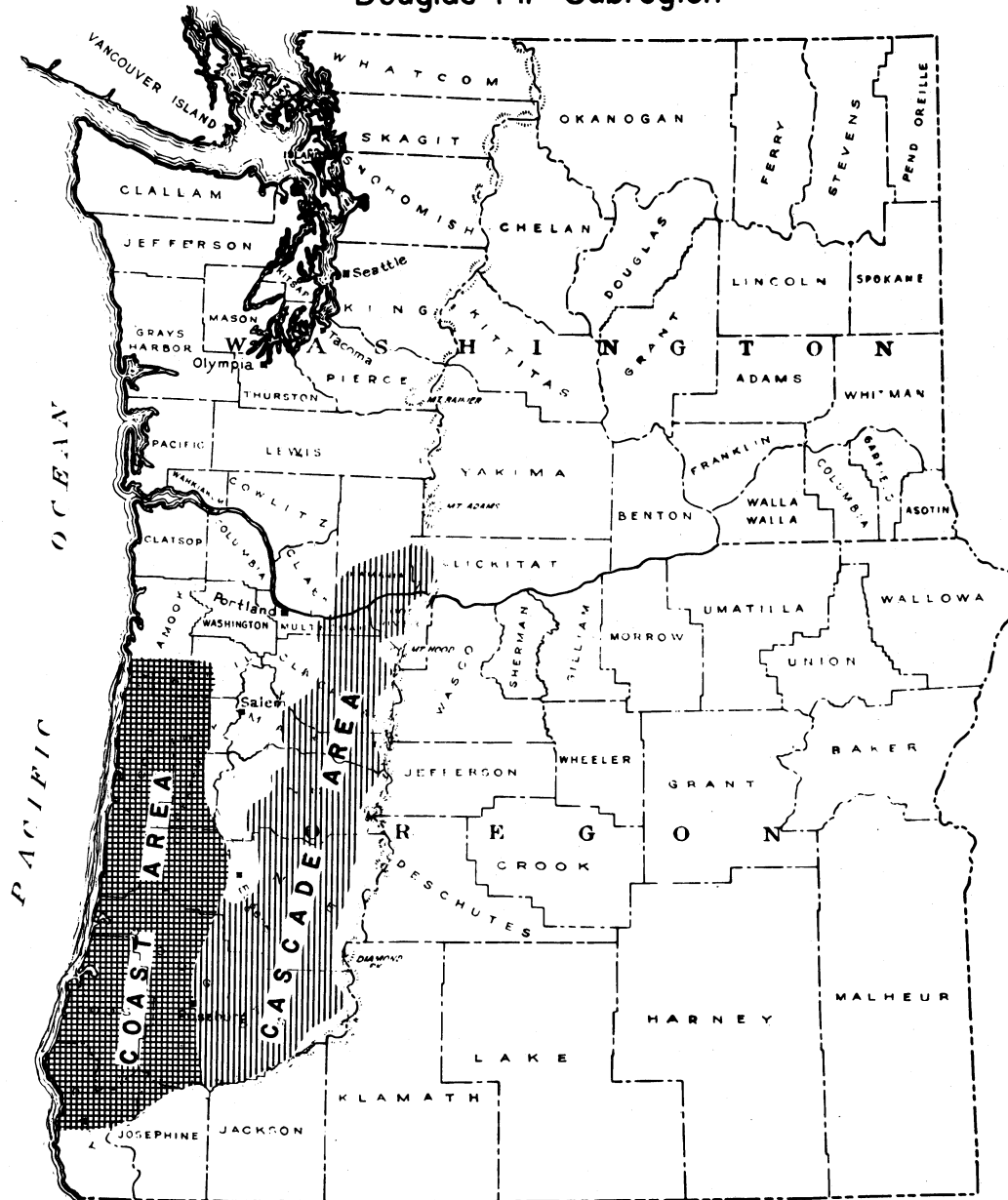


Table 2.-- Total net volume of blowdown and beetle-killed timber  
(Million board feet, log scale Scribner)

County	Blowdown all species					Beetle-kill Douglas- fir
	Class of blowdown				Total	
	Heavy	Moderate	Light	Cut over		
Coast Area						
Tillamook	3.2	0.2	13.5	0.6	17.5	0.1
Yamhill	0.5	0.1	15.6	1.1	17.3	1.7
Lincoln	46.5	4.9	123.2	8.4	183.0	5.0
Polk	12.4	0.4	15.6	3.0	31.4	7.2
Benton	21.5	2.6	20.6	10.3	55.0	12.2
Lane (West)	204.4	32.6	284.2	56.1	577.3	29.1
Douglas (West)	176.0	111.4	1259.9	63.7	1611.0	272.2
Coos	199.4	41.1	452.5	42.3	735.3	97.7
Curry	43.2	13.1	402.4	2.1	460.8	25.6
Josephine (West)	1.5	1.8	56.9	0.5	60.7	4.0
Total Coast	708.6	208.2	2644.4	188.1	3749.3	454.8
Cascade Area						
Skamania	1.0	4.7	122.4	2.2	130.3	28.7
Klickitat			9.8	0.7	10.5	4.8
Total Wash.	1.0	4.7	132.2	2.9	140.8	33.5
Multnomah			32.3	0.5	32.8	0.1
Hood River	3.7	1.0	46.4	3.0	54.1	2.9
Clackamas	8.5	5.8	578.1	7.7	600.1	29.6
Marion	0.6	0.5	201.1	3.2	205.4	2.5
Linn	17.9	17.9	769.3	24.9	830.0	39.9
Lane (East)	49.4	63.8	1274.2	63.4	1450.8	210.3
Douglas (East)	19.5	31.0	1620.3	43.9	1714.7	229.8
Jackson	0.2		68.9	0.1	69.2	0.8
Josephine (East)			29.5	3.2	32.7	0.8
Total Oregon	99.8	120.0	4620.1	149.9	4989.8	516.7
Total Cascade	100.8	124.7	4752.3	152.8	5130.6	550.2
Grand Total	809.4	332.9	7396.7	340.9	8879.9	1005.0
Estimate of Sampling Error						
Coast Area	13%	16%	19%	31%	13%	
Cascade Area	45%	38%	34%	50%	31%	
Total sampling error - - - - -					25%	

# MAP I

## AREAS MAPPED: 1952 BLOWDOWN-BARKBEETLE SURVEY Douglas-Fir Subregion



### LEGEND



Area mapped 100 percent for blowdown and beetle-killed timber (flight lines 1 mile apart)



Area mapped 100 percent for beetle-killed timber, 12 1/2 percent for blowdown (flight lines 2 miles apart)

Pacific N. W. Forest & Range Experiment Station  
Portland, Oregon  
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